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**Appendix:**  
**Substitute first page of Specification**

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**A METHOD FOR EVALUATING RELATIVE  
OXYGEN SATURATION IN BODY TISSUES**

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[0001] This is the United States national stage of international application PCT/US2005/009185, filed 18 March 2005, which claims the benefit of the 19 March 2004 filing date of United States provisional application serial number 60/554,456, under 35 U.S.C. § 119(e).

[0002] The development of this invention was partially funded by grants R03EY012887 and P30EY02377 from the National Eye Institute, National Institutes of Health, Bethesda, Maryland; and from a Space Product Development grant from the National Aeronautics and Space Administration. The Government has certain rights in this invention.

**TECHNICAL FIELD**

[0003] This invention pertains to a method to measure relative changes in blood oxygen saturation using hemoglobin spectral curves generated from reflected light from *in vivo* blood vessels, e.g., retinal macro- and micro-circulation.

**BACKGROUND ART**

[0004] The oxygen supply of the retina is provided by both the choroidal and retinal circulation. Because of the high oxygen needs of the retina, any alteration in circulation such as seen in diabetic retinopathy, hypertension, sickle cell anemia, and vascular diseases can result in impairment. Pathological conditions in the retina and optic nerve head (ONH) can cause vision loss and blindness. Both structures have a high demand for oxygen, and loss of the normal oxygen supply through vascular insufficiency is believed to play an important role in retinal and ONH pathology. See, G. A. Cioffi *et al.*, "Optic nerve blood flow in glaucoma," *Semin. Ophthalmol.*, Vol. 14, no. 3, pp. 164-170 (1999); A. Harris *et al.*, "Simultaneous management of blood flow and IOP in glaucoma," *Acta Ophthalmol. Scand.*, Vol. 79, pp. 336-341 (2001); and S. S. Hayreh, "Factors influencing blood flow in the optic nerve head," *J. Glaucoma*, Vol. 6, pp. 412-425 (1997). Hypoxia of the retina and ONH is